INCH-POUND

MIL-PRF-1/1147B
29 June 1999
SUPERSEDING
MIL-E-1/1147A(SigC)
17 July 1959

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, MICROWAVE NOISE SOURCE
TYPE 6782

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the electron tube described herein shall consist of this document and the latest issue of MIL-PRF-1.

DESCRIPTION: Gaseous discharge diode, S band. 12/
Cathode: Filamentary type.
Dimensions: In accordance with outline drawing (see figure 3).
Base: Miniature Bi-pin, in accordance with outline drawing (see figure 3).
Mounting position: Any.

ABSOLUTE RATINGS:

| Parameter: | If | Ib | Epp | TA | T Bulb |
|---|---|---|---|---|---|
| Unit: | ma | mA dc | V ac | °C | °C |
| Maximum: | --- | --- | --- | +85 | +125 |
| Minimum: | --- | --- | 2,000 | -55 | --- |
| Test conditions: | 0 | 250 | --- | --- | --- |

See footnotes at end of table I.

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GENERAL:

The Preproduction sample approval requirements in Signal Corps Drawing SC-A-46600 hereby replace any qualification requirements existing in or otherwise referable to the data in this specification sheet.

(Copies of Signal Corps Drawing SC-A-46600, "Preproduction Sample Approval in Lieu of Qualification Requirements in Specifications," may be obtained from the acquiring activity or as directed by the contracting officer.

Qualification – Required. 13/ 14/

Holding Period – 168 hours.

TABLE I. Testing and inspection.

| Inspection | Method | Conditions | Symbol | Limits | | Unit |
|---|---|---|---|---|---|---|
| | | | | Min | Max | |
| Qualification | | 13/ 14/ | | | | |
| Variable frequency | 1031 | No voltages applied 10/ | --- | --- | --- | --- |
| Electrode voltage | 1261 | If-1 = 170 mA dc<br>If-2 = 170 mA dc | Ef-1<br>Ef-2 | ---<br>--- | 15.0<br>15.0 | V dc<br>V dc |
| Voltage drop | 3337 | Forward and reverse 1/ 2/ | Etd-a<br>Etd-b | 41<br>41 | 48<br>48 | V dc<br>V dc |
| Ionization | 3347 | Rp = 8,000 ohms 3/ | Ez | --- | 2,000 | V ac |
| Noise figure | 4260 | F = 3,300 MHz 3/ 4/ 5/ 7/ 11/ | Nr-1 | 8.60 | 9.10 | dB |
| Noise test | 3278 | F = 3,300 MHz 3/ 4/ 5/ 7/ 11/ | Nr-1 | 8.60 | 9.10 | dB |
| Match (1) | 4256 | F = 3,270 MHz 4/ 6/<br>Ib = 250 mA dc | VSWR | 1.30:1 | 1.38:1 | --- |
| Match (2) | 4256 | F = 3,270 MHz 4/ 6/<br>Ib = 0 mA dc | VSWR | --- | 1.02:1 | --- |
| Life test | --- | Epp = 2,000 V ac<br>Rp = 8,000 ohms 3/ 8/ 9/<br>(One minute on, two minutes off) | No. | 2,500 | --- | Cycles |
| Life test end points: | --- | | | | | |
| Noise figure<br>Ionization | 4260<br>3347 | 11/ | Nr-1<br>Ez | 8.55<br>--- | 9.15<br>2,000 | dB<br>V ac |

1/ The tube shall be tested in the circuit shown in figure 1 or equivalent.

2/ In the test circuits on figure 1, with a filament current of 170 mA dc, the tube shall operate within three tries. The tube shall be tested and then reverse tested using alternate ends as anode and cathode. One reading of Etd shall be taken not less than 15 seconds after ionization, in each direction.

3/ The tube shall be tested in total darkness.

4/ The test shall be made with the tube mounted in the Noise Tube Mount (see figure 4) of this specification. Termination shall be made by a matched RG-48/U termination, having a minimum VSWR of 1.01:1 such as Hewlett-Packard S-914A, or equivalent.

5/ The frequency specified is that of the local oscillator.

6/ The frequency specified is that of the signal generator.

7/ Excess noise ratio shall be measured by comparison with an approved standard. The excess noise ratio measurement tests shall be made using the test circuit of figure 2 or equivalent. The VSWR, looking into the balanced mixer, shall not be greater than 2:1. The excess noise ratio measurement tests shall be made, using the test circuit of figure 2 or equivalent. The VSWR, looking into the balanced mixer, shall not be greater than 2:1.

TABLE I. Testing and inspection - Continued.

8/ The tube shall be tested at an ambient temperature of +85°C.

9/ Life test samples shall consist of one tube per lot. A lot shall consist of one week's production. No lot shall be shipped until the completion of life test. Failure of initial samples shall require a successful life test of two additional tubes before release of a lot for shipment.

10/ Life test end points shall apply.

11/ The excess noise ratio (Nr -1) is defined in dB, as Nr - 1 = 10 log ( $\frac{Te}{290} - 1$ ) where Te is the effective electron temperature.

12/ The noise frequencies generated by this tube cover a broad band of frequencies. This bandwidth is limited only by the type of mount used. This tube is normally used with a mount in RG-48/U waveguide, at a 90° angle in the H plane. Other waveguide sizes may be used with properly adapted mounts.

13/ Qualification inspection and first article testing should be in accordance with Appendix E and F of MIL-PRF-1. The request for qualification inspection shall be addressed to: Defense Supply Center Columbus, CODE VQE, 3990 East Broad Street, Columbus, Oh 43216-5000..

14/ Electron tube type 6782 acquired directly or indirectly on Army contracts, shall be marked "US Army" either above or preceding the type designation as specified in the bid request or contract. The letters "JAN" or any abbreviation thereof shall not be used.

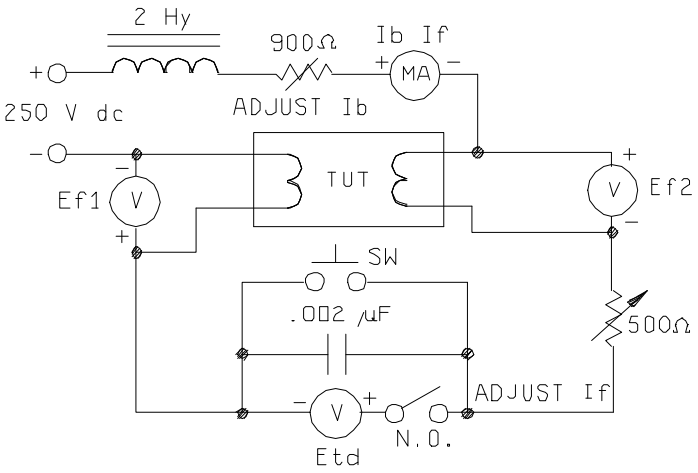



FIGURE 1. DC test circuit.

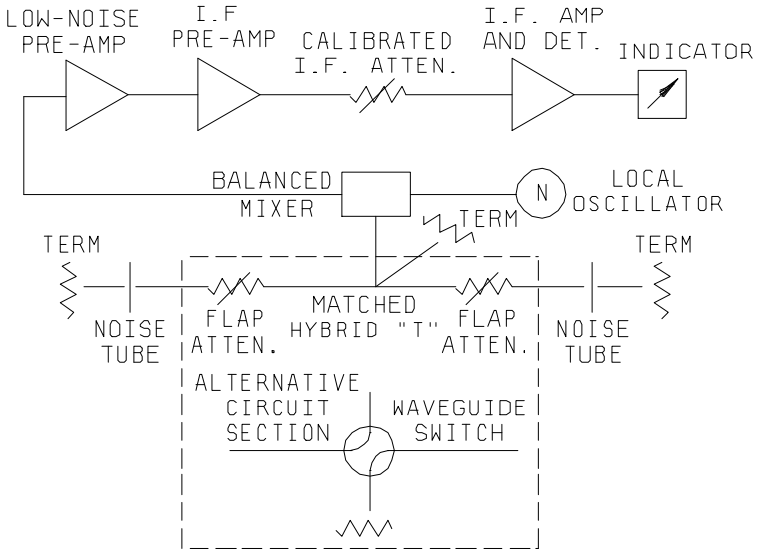
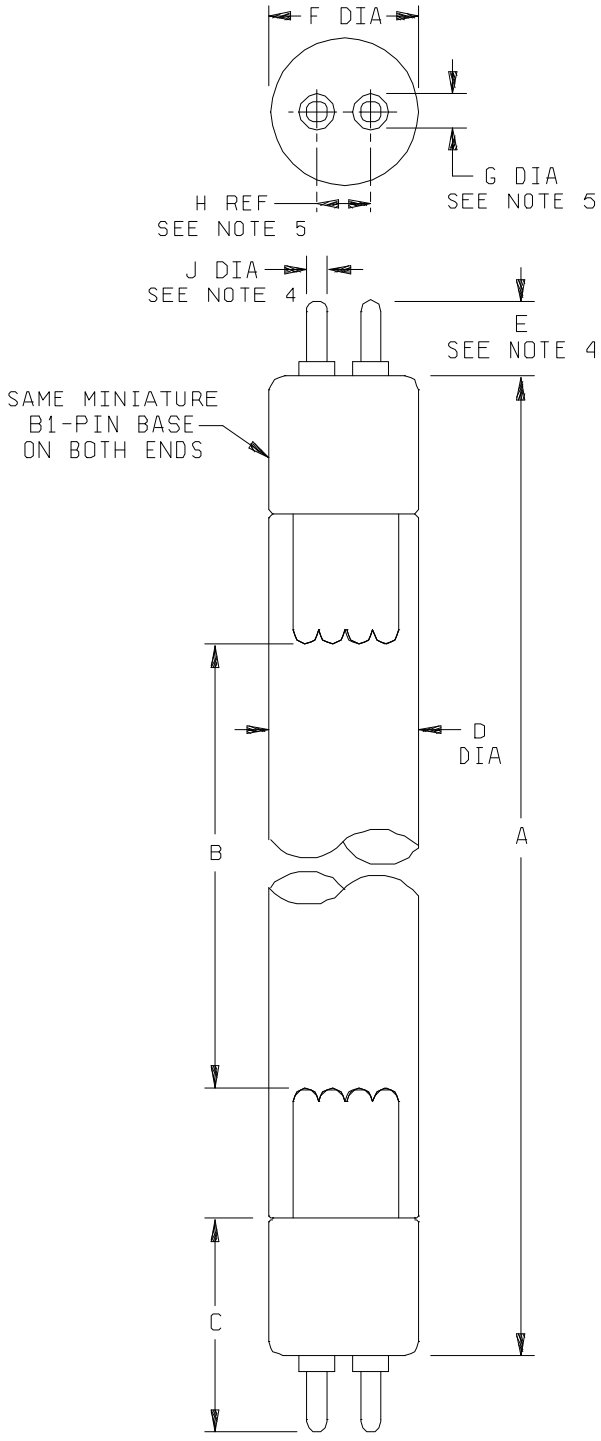


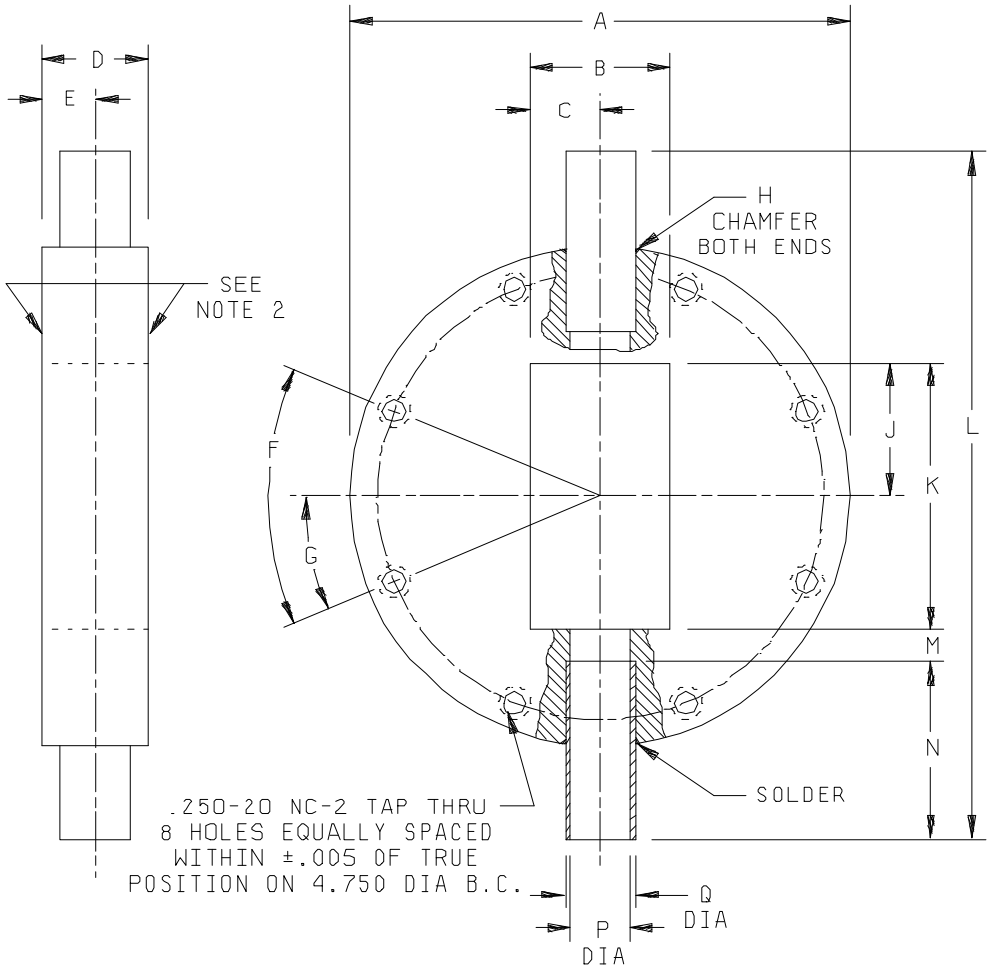

FIGURE 2. Test circuit for excess noise measurements.




| Ltr | Dimensions | | | |
|---|---|---|---|---|
| | Inches | | Millimeters | |
| | Min | Max | Min | Max |
| A | 8.187 | 8.594 | 207.95 | 218.29 |
| B | 5.750 | --- | 146.05 | --- |
| C | --- | .875 | --- | 22.23 |
| D | .555 DIA | .565 DIA | 14.10 DIA | 14.35 DIA |
| E | .260 | .325 | 6.60 | 8.26 |
| F | .550 DIA | .560 DIA | 13.97 DIA | 14.22 DIA |
| G | .135 DIA | .145 DIA | 3.43 DIA | 3.68 DIA |
| H | .187 REF | | 4.75 REF | |
| J | .090 DIA | .105 DIA | 2.29 DIA | 2.67 DIA |

NOTES:
1. All dimensions are in inches, with metric equivalent.
2. Tubes must pass through gauge .585 DIA and 9 inches long.
3. Planes of pins to be approximately parallel on both ends of tube.
4. Includes solder and wire.
5. Outer circle indicates maximum excursion of pin including variations in center to center spacing, pin diameter and tilt. Reference dimension is center to center of .140 inch diameter circles.

FIGURE 3. Electron tube, type 6782 (noise source).




NOTES:
1. All dimensions are on the next page.
2. Sides shall be parallel within .002 inch total indicator reading.

FIGURE 4. Mount for electron tube, type 6782 (noise source).

| Ltr | Dimensions | | | |
|---|---|---|---|---|
| | Inches | | Millimeters | |
| | Min | Max | Min | Max |
| A | 5.3115 | 5.3135 | 134.912 | 134.963 |
| B | 1.483 | 1.487 | 37.67 | 37.77 |
| C | .7415 | .7435 | 18.834 | 18.885 |
| D | 1.123 | 1.127 | 28.52 | 28.63 |
| E | .5615 | .5635 | 14.262 | 14.313 |
| F | 45° | | 45° | |
| G | 22.5° | | 22.5° | |
| H | .0625 x 45° | | 1.588 x 45° | |
| J | 1.419 | 1.421 | 36.04 | 36.09 |
| K | 2.838 | 2.842 | 72.09 | 72.19 |
| L | 7.3115 | 7.3125 | 185.712 | 185.763 |
| M | .325 | .335 | 8.26 | 8.51 |
| N | 1.905 | 1.907 | 48.39 | 48.44 |
| P | .623 DIA | .627 DIA | 15.82 DIA | 15.93 DIA |
| Q | .740 DIA | .745 DIA | 18.80 DIA | 18.92 DIA |

FIGURE 4. Mount for electron tube, type 6782 (noise source) - Continued.

Custodian:
Army - CR
DLA - CC

Review activities:
Army - MI

Preparing activity:
DLA - CC

(Project 5960-A253)